

## Da Vinci OA2000 - Optical Ethernet Service System

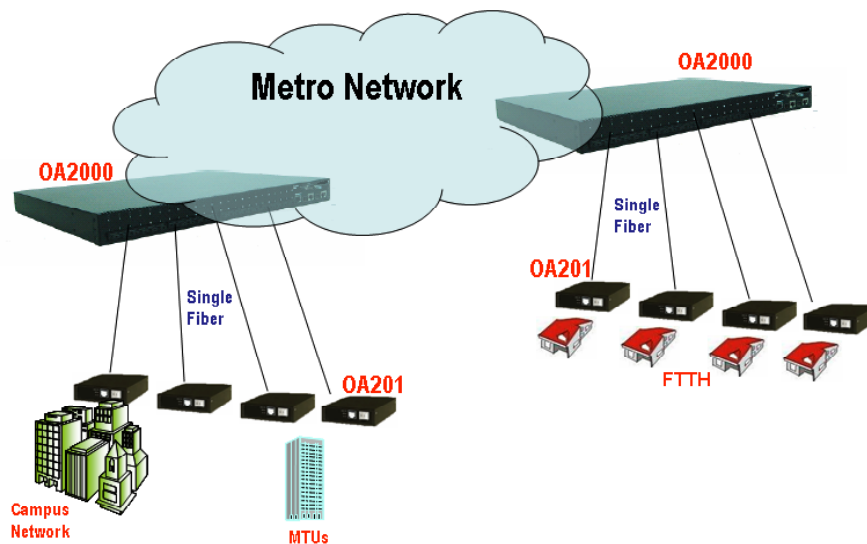


### MRV Cost-performance FTTX Metro Ethernet Solution

MRV is a leading provider of optical transport solutions as well as carrier class Ethernet access solutions to carriers around the globe.

Now, MRV offers this unsurpassed level of quality and performance to Operators and Network Service Providers (NSP) with its Optical Access OA2000 L2/4 Series Optical Ethernet Service System. MRV's Optical Access OA2000 approach to broadband access is unique. And its cost-performance solutions are among the best in the industry. MRV is looked upon as the quality leader in the telecom industry.

The OA2000 L2/4 Series is a unique integration of a carrier class Ethernet access with optical transport into one Optical Ethernet Network System. It enables NSPs to build their own low-cost FTTX access network solutions for Business and high end users. MRV Optical Access OA2000 L2/4 Series Optical Ethernet Service System offers L2/4 traffic aggregation for broadband access network, providing the connection of the Customer-Edge on one side and the Backbone Network on the other.



The MRV OA2000 Optical Access System solutions utilize advanced Ethernet access aggregator (OA2000) and providing direct optical fiber connectivity to the OA201 Optical Network Termination (ONT). It offers high speed, single fiber access networks with unique cost-performance benefits for everyone from utilities, to service providers, to telecommunications carriers.

The Optical Access OA2000 L2/4 Series Optical Ethernet Service System offers the most cost-effective range of features for the telecommunications industry:

### **1. Fiber Cost Savings: Two-way traffic on a single-core fiber**

- The Optical Access OA2000 L2/4 Series allows 2-way traffic on the same fiber path, allowing more cost-effective and efficient use of fiber resources.

### **2. Scalability and Easy Expansion**

- Optical Access OA2000 L2/4 Series offers high bandwidth:  
Down Stream: 100 Mbps per subscribers.  
Up Stream: 100 Mbps per subscribers.
- Easy new subscribers add-on , guaranteed network expansion.

### **3. Advanced Features**

- IGMP snooping function allows for efficient transmission of Multicast data such as live video stream.
- VLAN function provides sufficient security between end users.

### **4. Advanced Operations and Maintenance Management**

The MRV Optical Access OA2000 Series offers advanced operations and maintenance capabilities:

- Loop Testing/Power Failure Alarms/Subscriber Port Monitoring.
- SNMP-based Network Management using Mega Vision Pro Service Network Management System.

## **Optical Access OA2000 L2/4 Series Optical Ethernet Service System**

MRV's OA2000 L2/4 Series Optical Ethernet Service System combines the technological excellence of metro area Ethernet technology and an Optical Ethernet Service system that offers the most effective use of fiber optic resources. The OA2000 L2/4 Series provides L2/4 traffic aggregation for your broadband access network, linking the Customer Edge on one side and the Backbone Network on the other. The OA2000 L2/4 Series guarantees the most efficient use of fiber optic facilities and the most cost-effective use of space. All of this is supported by MRV's world-class network management technology.

### **Advanced Operation and Maintenance Capabilities**

MRV's OA2000 L2/4 Series Optical Ethernet Service System features comprehensive Network Management and Maintenance capabilities. Real time data (power failure alarms and subscriber port status information) is gathered from the subscriber site and the customer interface and is forwarded to the monitoring equipment and the element management system using the Simple Network Management Protocol (SNMP). MRV's unique Mega Vision Pro Network Management System provides the most advanced and informative information management features to cost-effectively manage your network in today's competitive environment.

### **Loop Tests**

The unique loop test capabilities of the OA2000 L2/4 Series provides testing functions for cable facilities and customer premise equipment, making fault isolation and identification quick and easy. Loop test information is received from the subscriber-side branch unit (OA201) and collected at the access unit (OA2000) to be sent to the monitoring equipment or network management system.

**Subscriber Port-Link Status Monitoring**

The subscriber port link status information is monitored by the element management system using TELNET or SNMP.

**Power Failure Alarm Monitoring**

Power failure alarms make it easy to localize a fault and distinguish between cable faults and local power failures.

**Network Control through Advanced QOS and Rate Limiting**

The OA2000 switch prioritizes each packet based on the required level of service using four priority queues with strict or Weighted Round Robin Queuing. It uses IEEE 802.1p to prioritize incoming traffic based on input from the end-station application.

These functions can be used to provide independent priorities for delay-sensitive data and best-effort data.

The OA2000 switch also supports several common methods of prioritizing layer 3/4 traffic to meet application requirements.

Traffic can be prioritized based on the priority bits in the IP frame's Type of Service (ToS) octet. When these services are enabled, the Priorities are mapped to a Class of Service value by the switch. After which, the traffic is sent to the corresponding output queue.

The Rate Limiting feature controls the maximum rate for traffic transmitted or received on an interface. Rate limiting is configured on interfaces at the edge of a network to limit traffic into or out of the network. Traffic that falls within the rate limit is transmitted, while packets that exceed the acceptable amount of traffic are dropped.

**Fault-Tolerance**

Spanning tree is a link management protocol that provides path redundancy while preventing undesirable loops in the network.

The OA2000 switch performs the IEEE802.1D (Spanning Tree) protocol, the IEEE802.1s\*(Multiple Spanning Tree), and the IEEE802.1w (Rapid Spanning Tree) protocol for Fault-Tolerance. The OA2000 also provides redundant power supply hook-ups to enable simultaneous connections to two independent power sources to ensure the system reliability.

**Enhanced Security Features**

The Optical Access Series switches offer enhanced data security through a wide range of security features that protect network management and administrative traffic, secure the network from unauthorized users, provide granular levels of network access to users and track where users are located.

Secure Shell (SSH), Secure Telnet (v1.5/2.0) port based security, Simple Network Management Protocol version 3 (SNMPv3\*) and network management information, thereby, protecting it from tampering or eavesdropping. Remote Access Dial-In User Service (RADIUS) authentication enables centralized access control of switches and restricts unauthorized users from altering the configurations. Alternatively, a local username and password database can be configured on the switch itself. Multi levels of authorization on the switch console and two levels on the web-based management interface provide the ability to give different levels of configuration capabilities to different administrators.

Port security and 802.1x provide the ability to keep unauthorized users from accessing the network. Port security limits access on an Ethernet port based on the MAC address of the device that is connected to it. It can also be used to limit the total number of devices plugged into a switch port, thereby, reducing the risks of rogue wireless access points or hubs. 802.1x can be used to authenticate users based on username and password (or other credentials) via a centralized RADIUS server. This is particularly useful for a mobile workforce because the authentication will be executed regardless of where the user connects to the network.

ACL's restrict access to sensitive portions of the network by denying packets based on source and destination MAC addresses,

IP addresses, or TCP/UDP ports. ACL lookups are done in hardware, therefore, forwarding and routing performance are not compromised when implementing ACL-based security in the network. The Optical Access Series switches offer VLAN, router and port-based ACL's.

### **Network Availability**

The OA2000 provides efficient use of resources in bandwidth-hungry applications. It supports the Internet Group Management Protocol (IGMPv1/2) snooping to identify multicast traffic and it ensures an efficient utilization of the bandwidth. The OA2000 is ideal for server-to-server backups.. An advanced feature of the OA2000 includes support for VLAN's, trunking and packet priority.

### **Network Management**

The OA2000switch supports the SNMP protocol and the Telnet interface delivers comprehensive in-band management. The system can be managed and monitored using the SNMP/RMON protocol through computers equipped with network management software or via an Internet web browser. LED indicators are located on the front panel to assist network administrators in troubleshooting. A Port Mirroring feature provides a non-intrusive mechanism for traffic inspection across the entire switch.

### **Physical Ports**

- 24 Single Fiber WDM 100Base-FX ports
- 2 Combo G (RJ-45/SFP) ports

### **Remote Maintenance**

The MRV OA2000 switch Series sets the standard for Network Management and Maintenance capabilities:

- Loop testing is executed in-service, with no maintenance personnel. Loop test frames are sent remotely, providing port status reports directly to the maintenance console.
- Power failure alarms distinguish between cable faults and local power failures.

The MRV OA2000 switch Series uses MegaVision Network Management System, which can provide Fault, Performance, and Configuration Management, in one package.

### **Optical Interface**

- Connector : Single Fiber with SC Connector
- Cable : 9/125µm SM Fiber (ITU-T G.652)
- Standard : 100BASE – FX
- Wave Length : Up stream – 1,3 µm Down stream - 1.5 µm
- Transmitting Power Range : -8 ~ -14 dBm
- Receiving Power Range : -8 ~ -30 dBm

### **L2 Features**

- Up to 8K MAC address entries
- 4M-bit for packet buffer size

- Provides flow control mechanism: backpressure for half duplex; IEEE802.3x for full duplex operation
- Store-and-forward forwarding scheme
- HOL (Head of Line) blocking prevention
- Port mirroring
- Provides Link Aggregation
- Up to 8 ports in one trunk
- Up to 4 trunk groups
- Trunks across switches
- Supports 802.3ad (LACP)
- Cisco Ether-channel (static truck)
- Load Balance for both Unicast and Multicast traffics
- Supports VLAN
- IEEE 802.1Q tagging VLAN
- Port-based VLAN
- Up to 255 active VLANs
- GVRP protocol for automatic VLAN registration and dynamic VLAN management
- 802.1v Protocol-Based VLAN\*
- Private VLAN
- IGMP (v1/v2) Snooping and Query function
- Broadcast Storm control
- IEEE 802.1D Spanning Tree protocol
- IEEE 802.1w Rapid Spanning Tree
- IEEE802.1s Multiple Spanning Tree\*

### Security

- RADIUS (Authentication)
- Access Control List
- Supports IEEE 802.1x port based security Management
- Supports SNMP v1/v2c/v3\* management functions
- Supports RMON (groups 1,2,3 and 9)
- Supports Web-based management
- Supports TELNET console interface
- Supports BOOTP and DHCP for IP address assignment
- Supports firmware upgraded by TFTP file transfer protocol through the Ethernet network
- Supports Firmware image upgrade by TFTP protocol
- Supports dual Firmware images
- Supports Configuration file upload/download by TFTP protocol
- Supports two or more Configuration files
- MegaVision (Windows)
- SNMP access IP filtering configuration
- Provides 1 Male DB9 RS-232C console interface configured as DTE for operation, diagnostics, status, and configuration information

- Provides Command Line Interface from the console port using a VT-100 terminal
- Supports SNMP
- Event / Error Log

### Quality of Service

- L2/L3/L4 Traffic Classification/Priority Management
- CoS by IEEE 802.1p 4 priority queues control
- Traffic Classification/Priority Management based on IP Precedence/TOS & DSCP/TOS
- Traffic Classification/Priority Management based on TCP/UDP port number
- Supports WRR for priority queues
- Strict scheduling for priority queue
- Rate Limiting (Ingress & Egress based)
- Supports DiffServ\*
- Supports Random Early Detection (RED)
- VLAN Membership
- Single IP address for management
- Trunking
- Packet Priority
- Port mirroring

### Mechanical

- Dimensions: 440mm x 324mm x 43mm (17.37" x 12.76" x 1.7")
- LED indicators: Port, Uplink, System, Diagnostic.

### Performance

- Switch Fabric: 8.8 Gbps
- MAC address: 8K

### Power Requirements

- Nominal AC Input Voltages: 110-240V
- DC Input Voltage: 12V
- Line Input Frequency: 47-63 Hz
- Maximum Power Consumption: 35W

### Safety

- CSA/NRTL (UL1950, CSA 22.2.9.50)
- TUV/GS (EN60950)

### Electromagnetic Compatibility

- CE Mark
- FCC Class A

- VCCI Class A
- CISPR Class A

### Environmental

- Temperature:
  - IEC 68-2-14
  - 0 to 50 degrees C (Standard Operating)
  - -40 to 70 degree C (Non-operating)
- Humidity: 10% to 90% (Non-condensing)
- Vibration: IEC 68-2-36, IEC 68-2-6
- Shock: IEC 68-2-29

### Key Features OA201

- One 10/100BASE-TX RJ-45 port
- One 100BASE-FX WDM Bi-directional Single Fiber Port with SC Connector
- LED Indication of Power on/off, Optical Link on/off, Loop Back Testing, UTP Link on/off, UTP Port Activity, UTP Bit Rates, UTP Full/Half Duplex
- Programmable Maximum Ethernet Frame Length from 1518 to 1536 bytes
- Denying/Allowing Forwarding MAC Address
- 2K MAC Address Table with 4 Layer Hashing Table for Automatic MAC Address Learning
- Optional Link Pass Through Function
- Optional Pause Frame By-Pass Function
- Auto Negotiation
- 802.3x Flow Control

### IEEE Standards Compliance

- IEEE 802.1Q VLAN
- IEEE 802.3 Ethernet
- IEEE 802.3u Fast Ethernet
- IEEE 802.3x Flow Control
- IEEE 802.3ac VLAN Tagging

### Electrical Interface

- Standard : 10BASE-T/100BASE-TX
- Cable : Category 5 UTP prefer
- Connector : RJ-45

### General Description

- Dimension : 35(H) X 110(W) X 180(D) mm
- Weight : 250g

- Power Consumption : 3 W maximum
- Power Supply : 1A at +12VDC (External power adapter accepting 50/60Hz 100-120V AC is included.)
- Operating Temperature : 0C ~ 40C
- Storage Temperature : -20C ~ 70C
- Tolerate Humidity : 10 ~ 90% RH (Non-condensing)

### Optical Interface

- Standard : 100BASE - FX
- Cable : 9/125  $\mu$ m meter SM Fiber (ITU-T G.652)
- Connector: Single fiber with SC Connector
- Wavelength : Transmit 1310nm / Receive 1550nm
- Transmitting Power Range : -8 ~ -14 dBm
- Receiving Power Range : -8 ~ -30 dBm

### Certification

- CE Mark
- FCC Class B
- VCCI Class B

### Remote Maintenance

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